Curriculum...from page 5

•related mental processes such as spatial visualization, estimation, and abilities prerequisite to formal mathematical thinking such as conjecturing and convincing.

Organization of the Curriculum

Based on this theoretical foundation, a draft of a new geometry curriculum and associated Logo activities was constructed. The curriculum is organized in four major strands. In the Paths strand, the concept of path is taught explicitly, both off computer as in walking and drawing and on computer as a record of the turtle's movements. This concept is then used to organize beginning geometric notions. In the Geometric Shapes: Special Paths strand, students think about shapes such as angle, triangles, rectangles, and other polygons as special paths. We believe that such activity helps them attend to and analyze the component parts of geometric shapes. The goals of the Motions strand is to use computer graphics to introduced students to geometric transformations and help them construct cognitive "building blocks" (such as mentally rotating shapes) that are important in dealing with spatial problems. Finally, the GeoTools strand uses special Logo commands that we created that permit students to create and label points with letters and to measure line segments and angles specified by these letters while remaining in a Logo environment. We believe that these special commands can be used to help students make the transition to a more formal, Euclidean perspective on geometric notions (as opposed to Logo's built-in differential and analytic perspective.)

Curriculum Components

The curriculum consists of the following components: Teacher materials, student materials, computer software, scope and sequence documents, and assessment instruments.

Research Support

The curriculum has been continually evaluated and revised. For example, evidence from field testing has supported our prediction that involvement with Logo curriculum helps students make the transition from the visual to the descriptive level of thought in the van Hiele hierarchy. In fact, after working with the activities, students attempting geometric tasks were less likely to conceptualize shapes based on their visual appearance, and more likely to conceptualize them in terms of their properties.

Palindrome... from page 7

Second Palindrome Problem

The second palindrome procedures use the same reverse procedure and function as a reporter. Palindrome now takes a number as input and reports the number of generations it takes before the number becomes a palindrome. Remember that since this new palindrome procedure is a reporter, it must be preceded by a command.

PRINT PALINDROME 157
3

```
to palindrome :number
output find.palindrome :number 1
end

to find.palindrome :number :counter
if :number = reverse :number [output
:counter]
print :number
output find.palindrome (:number + re-
verse :number) :counter + 1
end

to reverse :word
if empty? :word [output :word]
output word last :word reverse bl :word
end
```

Terrapin 3.0:

```
TO REVERSE :WORD
IF EMPTY? :WORD OUTPUT :WORD
OUTPUT WORD LAST :WORD REVERSE BL
REVERSE BL :WORD
END
```

An overnight problem

The following Record procedure records all of the numbers that take more than two (2) generations to become a palindrome. Two generations was arbitrarily chosen. You may wish to change this number in the record procedure.

```
to record :finish
if :start > :finish [stop]
make "generations palindrome :start
if :generations > 2 [print sentence
:start :generations]
record :start + 1 :finish
end
```

Type RECORD 1 100 to record all of the numbers between 1 and 100 which take more than 2 generations to become palindromes.

***Editor's note:** Just before press time we noted that PR PALINDROME 89 and PALINDROME 98 did not "work"! At the moment we're not sure why. Anyone out there have an idea?*